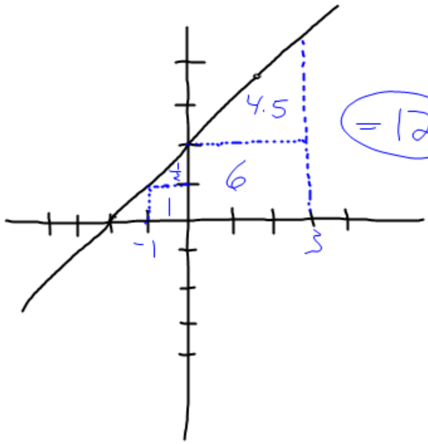
No Calculator - evaluate

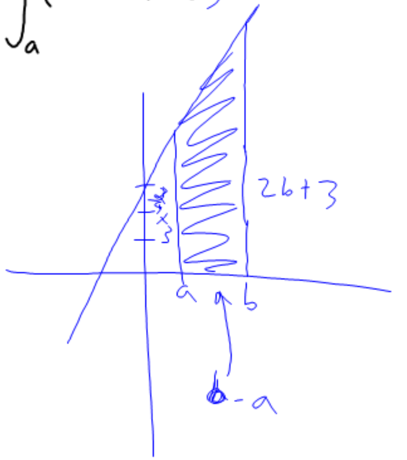
ⓐ $\displaystyle\int_{-1}^{3} \frac{x^2-4}{x-2}\,dx = \frac{\cancel{(x-2)}(x+2)}{\cancel{x-2}}$

$= 12$



=12

ⓑ $\displaystyle\int_{a}^{b} (2t+3)\,dt,\quad a>0$



$A = \frac{1}{2}(b_1+b_2)\cdot h$

$A = \frac{1}{2}\left(2a+3+2b+3\right)\cdot b-a$

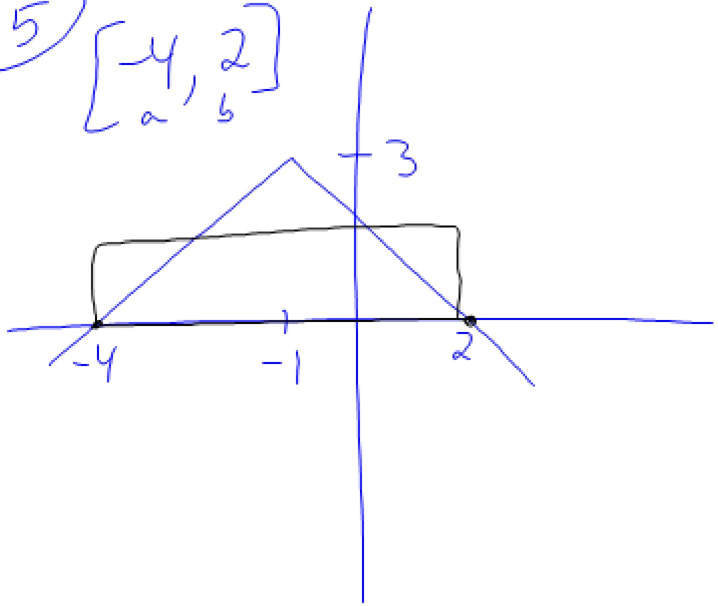
$A = \frac{1}{2}\left(2a+2b+6\right)(b-a)$

$(a+b+3)(b-a)$

$\cancel{ab}+b^2+3b-a^2-\cancel{ab}-3a$

$\boxed{b^2-a^2+3b-3a}$

15 $\underset{a\ \ \ \ \ b}{[-4, 2]}$

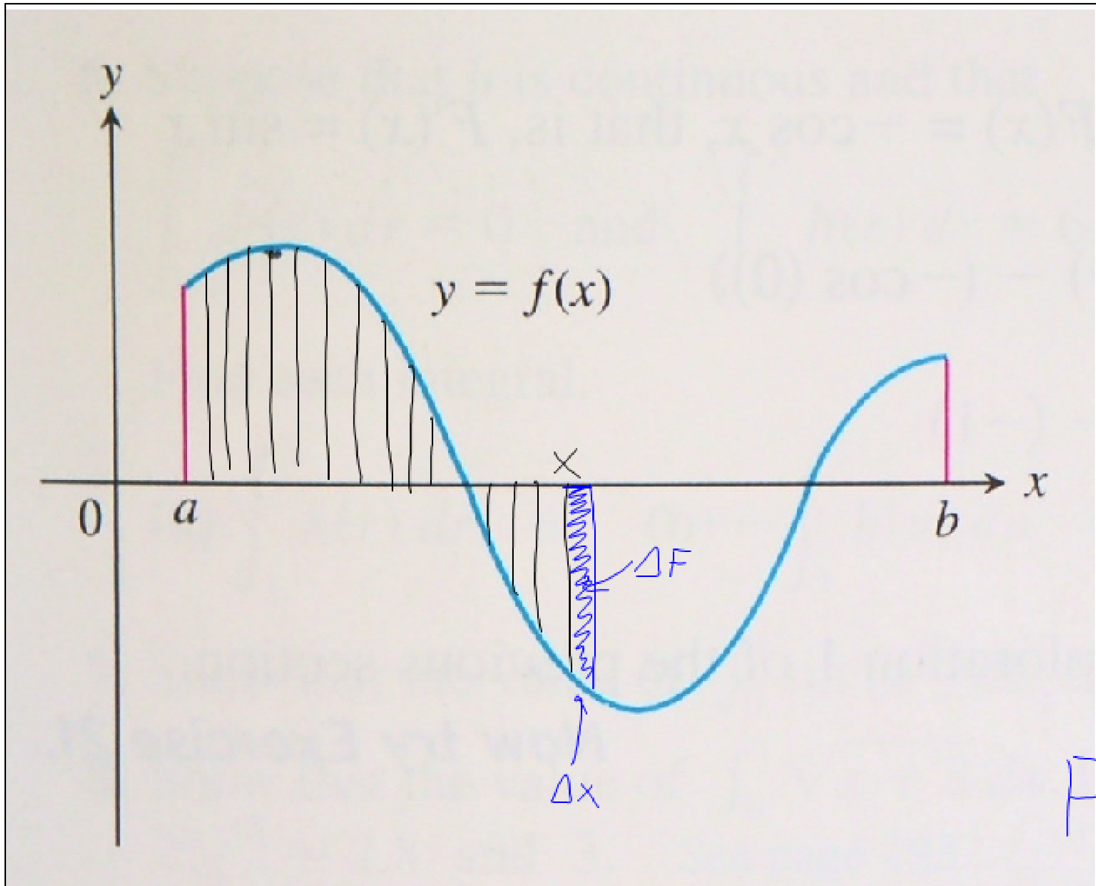


$$A = \frac{1}{2}(6)(3)$$
$$= 9$$

$$av(f) = \frac{1}{b-a}\int_a^b f(x)\,dx$$

$a = -4$
$b = 2$

$$av(f) = \frac{1}{2--4}\underbrace{\int_{-4}^{2} f(x)\,dx}_{Area}$$
$$= \frac{1}{6}\,Area$$
$$= \frac{1}{6}\cdot 9 = \frac{9}{6} = \boxed{3/2}$$



$$\int_a^x f(t)\,dt$$

$$F(x) = \int_a^x f(t)\,dt$$

height $f(\text{new } x\text{-round})$

$$F'(x) = \frac{\Delta F}{\Delta x}$$

Area $= f(x)\Delta x$

$\Delta F = f(x)\Delta x$

$F'(x) = f(x)$

derivative of integral of $f(x)$
is $f(x)$

$$\frac{d}{dx}\int_a^x f(t)\,dt = f(x)$$

$$\frac{d}{dx}\int_a^x f(t)\,dt = f(x)$$

the derivative of the integral of $f(x)$ is $f(x)$

FUNDAMENTAL THEOREM

integral is the antiderivative of the function

$$\int_a^x f(t)\,dt = F(x) + C$$

where $F(x)$ is the antiderivative of $f(t)$

$$\int_a^a f(t)\,dt = F(a) + C$$

$$0 = F(a) + C$$

$$C = -F(a)$$

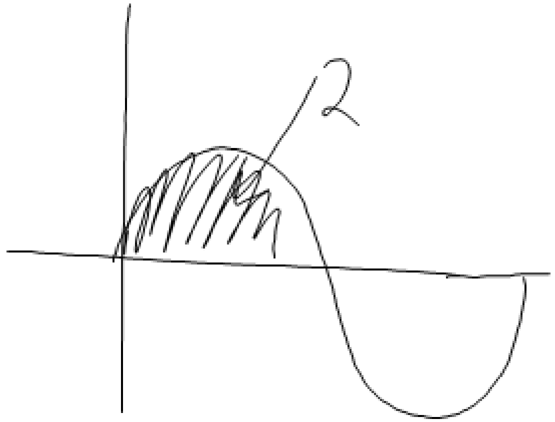
$$\boxed{\int_a^x f(t)\,dt = F(x) - F(a)}$$

antiderivatives

$F(x) = x^2$

$$\int_1^3 2x\,dx = F(3) - F(1)$$

$$3^2 - 1^2 = \boxed{8}$$



$F(x) = -\cos x$

$$\int_0^{\pi} \sin x\,dx \to -\cos(\pi) - -\cos(0)$$

$$-(-1) - -1 \boxed{= 2}$$

Sect. 5.3

#19-36

$\boxed{\text{Hw}}$

#45-50

Weekly Review (from last Friday)